

overcoating layer and at least one hydrophilic group spaced apart from the linking group by a hydrophobic region sufficient to prevent electron charge transfer across the hydrophobic region; and

a compound associated with the overcoating layer.

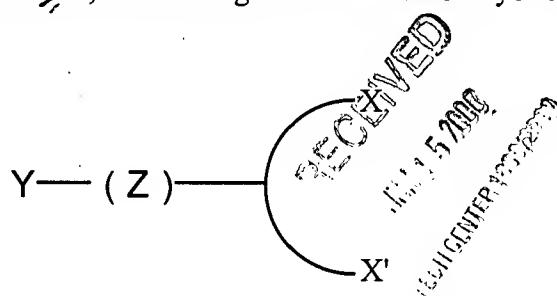
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50. The composition of claim 49, wherein the compound is associated with the overcoating layer via a ligand of the outer layer.

C1
51. The composition of claim 50, wherein the compound is associated with the hydrophilic group of the ligand.

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52. The composition of claim 49, wherein the ligands of the outer layer solubilize the composition in water.

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53. The composition of claim 49, wherein ligands of the outer layer comprise a compound of the formula, $H_2X((CH_2)_nCO_2H)_y$ and salts thereof, where X is S, N, P or O=P; n ≥ 6; and z and y are selected to satisfy the valence requirements of X.

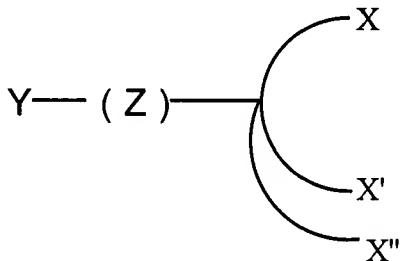
49
54. The composition of claim 49, wherein ligands of the outer layer comprise a compound of the formula



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where Y is a hydrophilic moiety; Z is a hydrophobic region having a backbone of at least six atoms; and X and X' are the same or different and are selected from the group consisting of S, N, P and O=P.

46

60 55. The composition of claim 49, wherein ligands of the outer layer comprise a compound of the formula



where Y is a hydrophilic moiety; Z is a hydrophobic region having a backbone of at least six atoms; and X, X', and X'', each are the same or different and are selected from the group consisting of S, N, P and O=P.

56. A water-soluble composition comprising:

a water-soluble semiconductor nanocrystal having a selected band gap energy; and
a compound associated with the semiconductor nanocrystal, wherein the water-soluble semiconductor nanocrystal exhibits photoluminescence having a quantum yield of greater than 10% in water.

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57. The composition of claim 56, wherein the water-soluble semiconductor nanocrystal further includes a ligand of the formula, $H_zX((CH_2)_nCO_2H)_y$ and salts thereof, associated with the water-soluble semiconductor nanocrystal, wherein X is S, N, P or O=P; $n \geq 6$; and z and y are selected to satisfy the valence requirements of X.

58. A water-soluble composition comprising:

a water-soluble semiconductor nanocrystal having a selected band gap energy; and
a compound associated with the semiconductor nanocrystal, wherein the water-soluble semiconductor nanocrystal exhibits photoluminescence having a quantum yield between about 10-30% in water.

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59. A composition comprising:

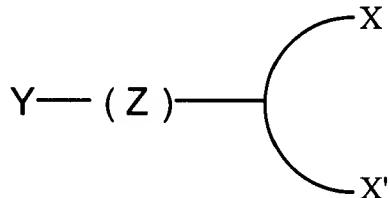
a semiconductor nanocrystal having a selected band gap energy, wherein the semiconductor nanocrystal includes a ligand of the formula, $H_zX((CH_2)_nCO_2H)_y$ or a salt thereof, where X is S, N, P or O=P; $n \geq 6$; and z and y are selected to satisfy the valence requirements of X; and

a compound associated with the semiconductor nanocrystal.

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A composition comprising:

a semiconductor nanocrystal having a selected band gap energy, wherein the semiconductor nanocrystal includes a ligand of the formula



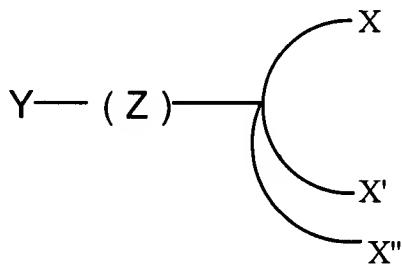
where Y is a hydrophilic moiety; Z is a hydrophobic region having a backbone of at least six atoms; and X and X' are the same or different and are selected from the group consisting of S, N, P and O=P.

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61. A composition comprising:

a semiconductor nanocrystal having a selected band gap energy, wherein the semiconductor nanocrystal includes a ligand of the formula

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where Y is a hydrophilic moiety; Z is a hydrophobic region having a backbone of at least six atoms; and X, X', and X'', each are the same or different and are selected from the group consisting of S, N, P and O=P.--